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PATENT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

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	)	Customer No.: 000043471
U.S. Serial No.: 09/811,702	)	
	)	Art Unit: 2614
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	)	Examiner: Michael R. Shannon
	)	

Title: DYNAMIC UPSTREAM AMPLIFIER POWER MANAGEMENT

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Applicant's respectfully request reversal of the Final Rejection of Applicant's claims at least for the following reasons.

I. Real Party In Interest

The Real Party in interest is General Instrument Corporation, which is a wholly owned subsidiary of Motorola, Inc.

II. Related Appeals And Interferences

There are no related appeals or interferences which may have a bearing on this case.

III. Status Of Claims

All claims, claims 1, 4, 5, 8, 9, 12 and 13, stand rejected. The rejections of claims 1, 4, 5, 8, 9, 12 and 13 are being appealed.

IV. Status Of Amendments

No amendments have been submitted subsequent to the final rejection. All prior amendments have been entered.

V. Summary Of Claimed Subject Matter

The application contains claims 1, 4, 5, 8, 9, 12 and 13, and claims 1, 5 and 9 are independent claims. Claims 1 and 9 are directed toward a cable modem for receiving downstream and transmitting upstream communication signals having an upstream power control system. Claim 5 is directed toward a method of upstream power control for a cable modem. Each of these claims are discussed below after a brief discussion of background.

As explained in paragraphs [0002 – 0007] of Applicant's disclosure a cable modem is the primary interface between a personal computer (PC) and a cable network (CATV). With a rapid increase in demand for broadband internet access and demand for access to CATV networks, cable modems have become widespread. Specification, para. [0004].

A cable modem modulates digital data from a PC for transmission over the CATV network and demodulate data received from the CATV network. Specification, para. [0004]. The typical data transmission profile of a cable modem is such that a large amount of data is downloading downstream from the Internet to the PC and only a small amount is uploaded from the PC to the Internet. Specification, para. [0006]. It also generally takes a user some time to view information that is downloaded. Specification, para. [0006]. Hence, there is a large percentage of time in which a cable modem is energized but is not actually modulating or demodulating any data. Specification, para. [0006]. This results in a tremendous waste of electrical power for an individual cable modem and especially when considering the aggregation from the large number of cable modems in use. Specification, para. [0006].

Claim 1 recites a cable modem for receiving down stream and transmitting upstream communication signals to a cable network having an upstream power control system for controlling power consumption, as described at least at [0022 and 0028]. The cable modem includes a MAC chip for synchronizing upstream communication signals, and outputting an upstream control signal, which is illustrated in Fig. 2, element 12 and described in at least paragraph [0024]. The cable modem also includes an upstream amplifier for receiving synchronized upstream communication signals from the MAC

chip, which is illustrated in Fig. 2, element 11 and described in at least paragraph [0026]. The cable modem also includes a complex programmable logic device (CPLD), coupled to the MAC chip and the upstream amplifier, which controls the upstream amplifier in response to the upstream control signal from the MAC chip, such that the CPLD causes the upstream amplifier to power on during transmission of upstream signals and power off when not transmitting the upstream signals, thereby reducing power consumption of the cable modem, which is illustrated in Fig. 2, element 13 (CLPD); Fig. 3; and Fig. 4, steps 402 and 410; and described in at least paragraphs [0026, 0028-0033]. The cable modem further requires that the CPLD 13 generates an amplifier switch signal (US_SWI in Fig. 3) for connecting said upstream amplifier to an RF tuner for transmission of said upstream data signal to the headend, and an amplifier control signal (US_AMP) for powering on and off the upstream amplifier, and that the CPLD generates the amplifier switch signal after the amplifier control signal is generated, thereby stabilizing the upstream amplifier (specification, para. [0028]).

Claim 5 recites a method of upstream power control for a cable modem. The method includes the step of selectively generating an upstream unamplified communication signal along with a control signal (US_OE), which is described at least in Fig. 3 and Fig. 4, steps 401 and 402 and at paragraph [0031]. The method includes controlling an upstream amplifier in response to said control signal such that said upstream amplifier is powered on to amplify said unamplified communication signal when generated and powered off when no upstream communication signal is being generated, thereby reducing power consumption of said cable modem, which is described at least in Fig. 4, steps 404-410, and described in paragraphs [0031-0032]. The method

further includes generating an amplifier control signal (US_AMP) and amplifier switch signal (US_SWI) responsive to said control signal (US_OE), which is described at least in Fig. 3, and paragraph [0031]. The method further requires that the amplifier switch signal is generated after said amplifier control signal, which is described at least in Fig. 3, and paragraphs [0029-0031].

Claim 9 recites a cable modem for receiving downstream and transmitting upstream communication signals to a cable network having an upstream power control system, as described at least at [0022 and 0028]. The cable modem includes a control circuit for synchronizing upstream communication with a cable network headend, wherein a control signal is generated, which is illustrated in Fig. 5, element 50 and described in at least paragraph [0027]. The cable modem also includes an upstream amplifier for receiving synchronized upstream communication signals from the control circuit, which is described at least in Fig. 5, element 11 and described in at least paragraph [0026]. The control signal causing the upstream amplifier to power on during transmission of said upstream data signals and power off when not transmitting said upstream data signals, thereby reducing said power consumption of said cable modem, which is illustrated in Fig. 3; and Fig. 4, steps 402 and 410; and described in at least paragraphs [0026, 0028-0033]. In the modem, the control signal comprises an amplifier control signal (US_AMP) for controlling said upstream amplifier and an amplifier switch signal (US_SWI) for connecting said upstream amplifier to an RF tuner for transmission of said upstream data signal to said network headend, which is described at least in Fig. 3, and paragraph [0031]. In the modem, the amplifier switch signal (US_SWI) is generated after said amplifier control signal (US_AMP) is generated, thereby stabilizing

said upstream amplifier, which is described at least in Fig. 3, and paragraphs [0029-0031].

VI. Grounds Of Rejection To Be Reviewed On Appeal

Rejection of claims 1, 4, 5, 8, 9, 12 and 13 under 35 U.S.C. § 103.

VII. Argument

A. The Combination Of McMullan Jr. And Jung, Even If Proper, *Arguendo*, Does Not Disclose All Of The Claimed Limitations

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fulton*, 391 F.3d 1195, 1199-02 (Fed. Cir. 2004). *Ecolochem Inc. v. Southern California Edison Co.*, 227 F.3rd 1361, 56 U.S.P.Q.2d (BNA) 1065 (Fed. Cir. 2000); *In re Kotzab*, 217 F.3d 1365, 1369 (Fed. Cir. 2000); *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2D (BNA) 1614, 1617 (Fed. Cir. 1999); *In re Jones*, 958 F.2d 347, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992); and *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). See also MPEP 2143.01, 2143.03 ("To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art") (citations omitted).

Neither McMullan Jr. nor Jung, taken alone or in combination, disclose or suggest causing an upstream amplifier of a cable modem to power on during transmission of upstream signals and power off when not transmitting said upstream signals, and to generate an amplifier switch signal after the amplifier control signal is generated, thereby

stabilizing said upstream amplifier in the manner recited in each of independent claims 1, 5 and 9.

McMullan discloses a method and apparatus for obtaining various statistics for remote terminals in a CATV system. McMullan, abs. More particularly, McMullan discloses a set top box which can provide upstream communications to the cable headend which powers on a frequency synthesizer, an amplifier and sets the gain level of a modulator when an upstream communication is desired. McMullan, col. 11: 44-65. McMullan discloses that "upon completion of transmission, microprocessor 504 also switches the RF circuitry off, thus reducing the noise output of the module and reducing the overall power demand." However, McMullan does not disclose to generate an amplifier switch signal for connecting the upstream amplifier to an RF tuner for transmission of the upstream data signal to the headend after the amplifier control signal is generated, thereby stabilizing said upstream amplifier.

Jung discloses a bidirectional trunk amplifier which uses an upstream pilot signal when requested by the headend. Jung, abs.; col. 4: 55-60. Jung also does not disclose to generate an amplifier switch signal for connecting the upstream amplifier to an RF tuner for transmission of the upstream data signal to the headend after the amplifier control signal is generated, thereby stabilizing said upstream amplifier. Indeed, Jung does not disclose or suggest to turn on/off an upstream data amplifier at all. In fact, as Jung primarily uses a bidirectional amplifier as the upstream data amplifier (Jung, Fig. 1, element 102), turning off the bidirectional amplifier would also likely inhibit receipt of downstream communications, rendering it impossible for the headend to "request" an upstream pilot signal from the CPU 609 in the system of Jung. Jung; col. 4: 48 through

col. 5: 17. In any case, Jung's discussion of when to generate an upstream pilot signal has no bearing on when to turn on or off the upstream amplifier, and Jung does not use a separate switching signal after turning on an upstream amplifier. The Examiner's allegations to the contrary are addressed in detail below.

1. Jung Does Not Disclose To Turn Off An Upstream Amplifier

The Final Office action alleges that Jung does disclose to turn off an upstream amplifier and states:

> The RF Amplifier 612 is clearly a piece of the Pilot Signal Generator 610, and when the Pilot Signal Generator 610 is turned off [col. 4, lines 49-60], the Amplifier is therefore also turned off. The Amplifier being a part of the Signal Generator 610 clearly shows that when the Signal Generator is turned on/off, so is the Amplifier.

Final Office action, pg. 3. While the RF Amplifier 612 is a part of the Pilot Signal Generator circuit 610, it is not an "upstream amplifier for receiving synchronized upstream communication signals from said MAC chip" as recited in claim 1, for example. Jung explicitly discloses an upstream amplifier (as part of bidirectional amplifier 102 in Figure 1) which receives signals from a MAC 206, in addition to disclosing the RF Amplifier 612 in pilot signal generator 610. Moreover, Jung clearly contemplates actively transmitting/receiving signals while the pilot signal generator 610 is turned off. Jung, col. 4: 49-60 "the pilot signal generator … may cause intereference with the signals, is turned off … the cable modem generates the pilot signal only if the headend (400) requests it." Clearly, RF Amplifier 612 in the pilot signal generator 610 does not receive upstream communication signals from MAC 206 in Jung. Jung, Fig. 6.

Moreover, amplifier 612 is only turned off when its entire circuit which it supports (a.k.a. pilot signal generator 610) is turned off. It is not turned off by a control signal and is clearly not switched by a switching signal after being turned on, as required by the claims. Finally, even when RF Amplifier 612 is deactivated, bidirectional amplifier 102, which actually transmits upstream signals from MAC 206, is still active in the Jung reference.

In short, contrary to the conclusions in the Office action, Jung does not disclose or suggest to turn off an upstream amplifier which receives communications from a MAC chip.

Accordingly, the combination of McMullan and Jung, even if considered proper, *arguendo*, does not disclose all of the claimed limitations of any of claims 1, 5 or 9, and hence does not render those claims unpatentable.

B. There Is No Motivation To Modify McMullan With The Disclosure Of Jung

As discussed above Jung itself does not turn off its upstream bidirectional amplifier 102. Accordingly, as Jung itself does not turn off its upstream bidirectional amplifier 102, there is clearly no motivation to modify McMullan Jr. to power on and off an upstream amplifier prior to switching to the upstream amplifier based on the teachings of Jung.

Accordingly, as neither McMullan Jr. nor Jung, taken alone or in combination, disclose or suggest all of the limitations of independent claims 1, 5 and 9, the combination of McMullan Jr. and Jung does not render those claims, nor claims, 4, 8 and 12-13 which depend on claims 1, 5 and 9, respectively, unpatentable.

Accordingly, Applicant respectfully requests the rejection to be withdrawn.

VIII. Claims Appendix

A copy of the claims under appeal is presented in the attached Claims Appendix.

IX. Evidence Appendix

None. No additional evidence is relied upon and no additional evidence is presented in an Evidence Appendix.

X. Related Proceeding Appendix

None.

XI. Conclusion

Based on the foregoing, Applicant respectfully requests reversal of the rejections and allowance of the above claims. Should any issues arise that prevent early allowance of the above application, the examiner is invited contact the undersigned to resolve such issues.

To the extent an extension of time is needed for consideration of this response, Applicant hereby request such extension and, the Commissioner is hereby authorized to charge deposit account number 502117 for any fees associated therewith.

Respectfully submitted,

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Claims Appendix

1. (previously presented) A cable modem for receiving down stream and transmitting upstream communication signals to a cable network having an upstream power control system for controlling power consumption comprising:

a MAC chip for synchronizing upstream communication signals, and outputting an upstream control signal;

an upstream amplifier for receiving synchronized upstream communication signals from said MAC chip; and

a complex programmable logic device (CPLD), coupled to said MAC chip and said upstream amplifier, which controls said upstream amplifier in response to the upstream control signal from said MAC chip, such that said CPLD causes said upstream amplifier to power on during transmission of upstream signals and power off when not transmitting said upstream signals, thereby reducing power consumption of the cable modem,

wherein said CPLD generates an amplifier switch signal for connecting said upstream amplifier to an RF tuner for transmission of said upstream data signal to said headend, and an amplifier control signal for powering on and off said upstream amplifier, and

wherein said CPLD generates said amplifier switch signal after said amplifier control signal is generated, thereby stabilizing said upstream amplifier.

Claims 2-3 Canceled.

4. (previously presented) The cable modem according to claim 1 [[3]] wherein said CPLD continues generating said amplifier control signal after said CPLD ceases to generate said amplifier switch signal, thereby truncation of said upstream data signal is avoided.

5. (previously presented) A method of upstream power control for a cable modem comprising the steps of:

selectively generating an upstream unamplified communication signal along with a control signal;

controlling an upstream amplifier in response to said control signal such that said upstream amplifier is powered on to amplify said unamplified communication signal when generated and powered off when no upstream communication signal is being generated, thereby reducing power consumption of said cable modem; and

generating an amplifier control signal and amplifier switch signal responsive to said control signal,

wherein said amplifier switch signal is generated after said amplifier control signal.

Claims 6-7 Canceled.

8. (previously presented) The method according to claim 5 wherein said amplifier control signal continues to be generated after said amplifier switch signal ceases to be generated.

9. (previously presented) A cable modem for receiving downstream and transmitting upstream communication signals to a cable network having an upstream power control system comprising:

a control circuit for synchronizing upstream communication with a cable network headend, wherein a control signal is generated; and

an upstream amplifier for receiving synchronized upstream communication signals from said control circuit; said control signal causing said upstream amplifier to power on during transmission of said upstream data signals and power off when not transmitting said upstream data signals, thereby reducing said power consumption of said cable modem,

wherein said control signal comprises an amplifier control signal for controlling said upstream amplifier and an amplifier switch signal for connecting said upstream amplifier to an RF tuner for transmission of said upstream data signal to said network headend, and

wherein said amplifier switch signal is generated after said amplifier control signal is generated, thereby stabilizing said upstream amplifier.

Claims 10-11 Canceled.

12. (previously presented) The cable modem according to claim 9 wherein said CPLD continues generating said amplifier control signal after said CPLD ceases to

generate said amplifier switch signal, thereby truncation of said upstream data signal is avoided.

13. (previously presented) The system according to claim 9 wherein said control circuit comprises:

a MAC chip for synchronizing upstream communication signals, and outputting said upstream control signal; and

a complex programmable logic device (CPLD), coupled to said MAC chip and said upstream amplifier, which controls said amplifier by generating said amplifier control signal and said amplifier switch signal in response to the upstream control signal from said MAC chip.